

What is claimed is:

1. A system comprising:
  - a signal splitter that receives a first signal and produces second signals in different frequency ranges from the first signal;
  - a duplex determining device that generates third signals comprising flagged second signals that are designated as being transmittable as one of partial duplex and full duplex;
  - a combiner that combines the third signals into a fourth signal;and
  - a transmitter that transmits the fourth signal.
2. The system of claim 1, wherein the signal splitter comprises a multiplexer.
3. The system of claim 1, wherein the signal splitter comprises a single-input-multiple-output switching element.
4. The system of claim 1, further comprising:
  - a cable coupled to the transmitter; and
  - a sensor coupled to said duplex determining device that senses the type of said cable, wherein the duplex determining device uses the type of cable to generate the third signals.
5. The system of claim 4, wherein the second signals are flagged for the full duplex transmission when they are at least one of,
  - (a) above a threshold value for return loss on the type of the cable,
  - (b) below a threshold value for attenuation on the type of the cable; and
  - (c) below a threshold value for echo on the type of cable.

6. The system of claim 4, wherein the second signals are flagged for the half duplex transmission when they are at least one of,

(a) below a threshold value for return loss on the type of the cable,

(b) above a threshold value for attenuation on the type of the cable; and

(c) above a threshold value for echo on the type of cable.

7. The system of claim 1, further comprising:

a memory device coupled to the duplex determining device that stores information corresponding to the type of cable being used to transmits the output signal, wherein the duplex determining device uses the information to generate the third signals.

8. The system of claim 7, wherein the second signals are flagged for the full duplex transmission when they are at least one of,

(a) above a threshold value for return loss on the type of the cable,

(b) below a threshold value for attenuation on the type of the cable; and

(c) below a threshold value for echo on the type of cable.

9. The system of claim 7, wherein the second signals are flagged for the half duplex transmission when they are at least one of,

(a) below a threshold value for return loss on the type of the cable,

(b) above a threshold value for attenuation on the type of the cable; and

(c) above a threshold value for echo on the type of cable.

10. The system of claim 1, wherein the combiner comprises:  
a multiplying device that multiplies the third signals times a variable value, such that each of the third signals is at a different frequency;  
and  
a summing device that receives the third signals from the multiplying device and generates the fourth signal therefrom, such that the fourth signal includes a sequential arrangement of the third signals.
11. The system of claim 1, wherein the fourth signal comprises one of frequency based tones, bins, and carrier signals.
12. The system of claim 1, wherein the first signal comprises at least one of audio data, video data, and raw data.
13. The system of claim 1, wherein the fourth signal is transmitted in one of an Ethernet system, a digital signal line (DSL) system, and a wireless system.
14. The system of claim 1, wherein:  
the first signal is a single wideband signal;  
the second and third signals are individual narrowband signals;  
and  
the fourth signal is a frequency domain multiplexed wideband signal.

15. A method comprising:

- (a) receiving a first signal;
- (b) forming second signals from the first signal, each of the second signals being in a different range of frequencies;
- (c) determining whether each of the second signals should be transmittable in partial duplex mode or full duplex mode;
- (d) forming third signals through flagging each of the second signals as being a partial duplex-type signal or a full-duplex type signal based on step (c);
- (e) combining the third signals to form a fourth signal; and
- (f) transmitting the fourth signal.

16. The method of claim 15, wherein step (c) comprises:

- (c1) determining the type of cable being used to transmit the fourth signal;
- (c2) individually determining whether characteristics of each of the second signals is above or below a threshold value corresponding to the type of cable being used; and
- (c3) individually flagging each of the second signals as being the partial duplex-type or the full duplex-type based on step (c2) corresponding to whether the characteristics of the second signal is above or below the threshold.

17. The method of claim 16, wherein the characteristics comprise at least one of return loss, attenuation, and echo.

18. The method of claim 16, wherein step (c1) comprises using a sensor to sense the type of the cable.

19. The method of claim 16, wherein step (c1) comprises looking up in a storage device the type of the cable.

20. The method of claim 15, further comprising:  
using a single wideband signal as the first signal;  
using narrowband signals as the second and third signals; and  
using a frequency domain multiplexed wideband signal as the  
fourth signal.
21. The method of claim 15, further comprising:  
using at least one of audio signals, video, signals, or raw data  
signals as the first to fourth signals.